
User's Manual for

JetProg

Universal 48-pindrive Programmer, expandable up to 256.

BeeProg

Universal 48-pindrive Programmer with USB/LPT interface and ISP capability

LabProg+

Universal 48-pindrive Programmer

SmartProg

Universal 40-pindrive Programmer with ISP capability

PREPROM-02aLV

Universal Memory Programmer

MEMprog

Universal memory Programmer

T51prog

MCS51 Series and Atmel AVR Microcontrollers Programmer with ISP capability

51&AVRprog

MCS51 Series and Atmel AVR Microcontrollers Programmer

PIKprog+

Microchip PICmicro Programmer with ISP capability

PIKprog

Microchip PICmicro Programmer

SEEpog

Serial EEPROM Programmer

ELNEC s.r.o.
Presov, Slovakia
October 2003



**COPYRIGHT © 1997 - 2003
ELNEC s.r.o.**

This document is copyrighted by ELNEC s.r.o., Presov, Slovakia. All rights reserved. This document or any part of it may not be copied, reproduced or translated in any form or in any way without the prior written permission of ELNEC s.r.o.

The control program is copyright ELNEC s.r.o., Presov, Slovakia. The control program or any part of it may not be analysed, disassembled or modified in any form, on any medium, for any purpose.

Information provided in this manual is intended to be accurate at the moment of release, but we continuously improve all our products. Please consult manual on **www.elnec.com**.

ELNEC s.r.o. assumes no responsibility for misuse of this manual.

ELNEC s.r.o. reserves the right to make changes or improvements to the product described in this manual at any time without notice. This manual contains names of companies, software products, etc., which may be trademarks of their respective owners. ELNEC s.r.o. respects those trademarks.

ZLI-0017D

How to use this manual

This manual explains how to install the control program and how to use your programmer. It is assumed that the user has some experience with PCs and installation of software. Once you have installed the control program we

recommend you consult the context sensitive HELP within the control program rather than the printed User's Manual. Revisions are implemented in the context sensitive help before the printed Users Manual.

**Dear
customer,**

*thank you for
purchasing one of the
ELNEC programmer.*

Note: *Since this User's manual is common for all ELNEC programmers, read section(s) for respective programmer, that you have bought, please.*

This manual contains two main sections:

Quick Start

Read this section if you are an experienced user. You will find only specific information regarding installation of the control program and use of your programmer. For more detailed instructions you may read the **Description in detail** section or the **Troubleshooting** chapter for the respective programmer.

Detailed description

Read this section for the respective programmer if you are a less experienced user or if you need detailed information. You may find some less relevant features of programmer described here, but all programmer features are described in this section along with details regarding installation of the control program. Read this section to explore all of the features provided by your programmer.

*Please, download actual version of manual from
ELNEC WEB site (www.elnec.com), if current one
will be out of date.*

Table of contents

How to use this manual	3
Introduction	9
Products configuration	13
PC requirements	14
Quick Start	15
Detailed description	17
JetProg	19
Introduction	20
JetProg elements	24
Connecting JetProg to the PC	25
Selftest and Calibration	27
Technical specification	28
BeeProg	33
Introduction	34
BeeProg elements	36
Connecting BeeProg to the PC	37
In-system serial programming by BeeProg	39
Selftest and Calibration	41
Technical specification	42
LabProg+	47
Introduction	48
LabProg+ elements	51
Connecting LabProg+ to the PC	52
Selftest and Calibration	54
Technical specification	55
SmartProg	59
Introduction	60
SmartProg elements	62
Connecting SmartProg to PC	63
In-system serial programming by SmartProg	64
Selftest and calibration	66
Technical specification	67
PREPROM-02aLV	71
Introduction	72
PREPROM-02aLV elements	74
Connecting PREPROM-02aLV programmer to PC	75
Selftest and calibration	77
PREPROM-02aLV specification	78
MEMprog	81
Introduction	82
Connecting MEMprog programmer to PC	84
Selftest and calibration	85
Technical specification	86
T51prog	89
Introduction	90
Connecting T51prog programmer to PC	92
In-System serial programming by T51prog	93
Selftest and calibration	95
T51prog specification	96



51&AVRprog	99
Introduction	100
Connecting 51&AVRprog programmer to PC	101
51&AVRprog specification	103
PIKprog+	105
Introduction	106
Connecting PIKprog+ programmer to PC	108
In-System serial programming by PIKprog+	109
Selftest and calibration.....	111
PIKprog+ specification	112
PIKprog.....	115
Introduction	116
Connecting PIKprog programmer to PC	117
PIKprog specification	119
SEEpog	121
Introduction	122
Connecting SEEpog programmer to PC	123
SEEpog specifications	125
Software	127
The programmer software.....	128
File	132
Device	136
Buffer	152
Options.....	158
Diagnostics	165
Help.....	166
Common notes	169
Software	170
Hardware	172
ISP (In-System Programming)	173
Other	178
Troubleshooting and warranty.....	179
Troubleshooting	180
If you have an unsupported target device	182
Warranty terms	183
Appendix	185
Appendix A - Device Problem Report form	187
Appendix B - Keep-Current Service.....	189
Appendix C - AlgOR service	191
Appendix D - registration card	193
Appendix E - CE certificates	195

Conventions used in the manual

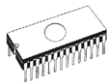
References to the control program functions are in bold, e.g. **Load**, **File**, **Device**, etc. References to control keys are written in brackets <>, e.g. <F1>.

Terminology used in the manual:

- | | |
|-------------------------------|--|
| <i>Device</i> | any kind of programmable integrated circuits or programmable devices |
| <i>ZIF socket</i> | Zero Insertion Force socket used for insertion of target device |
| <i>Buffer</i> | part of memory or disk, used for temporary data storage |
| <i>Printer port</i> | type of port of PC (parallel), which is primarily dedicated for printer connection. |
| <i>HEX data format</i> | - format of data file, which may be read with standard text viewers; e.g. byte 5AH is stored as characters '5' and 'A', which mean bytes 35H and 41H. One line of this HEX file (one record) contains start address and data bytes. All records are secured with checksum. |



Introduction



This user's manual covers all ELNEC programmers: **JetProg**, **BeeProg**, **LabProg+**, **SmartProg**, **PREPROM-02aLV**, **MEMprog**, **T51prog**, **51&AVRprog**, **PIKprog+**, **PIKprog** and **SEEpog**.

JetProg is a universal programmer and logic IC tester with 48 powerful pindrivers in base configuration, expandable up to 256. This design allows easily add new devices to the device list. Provides very competitive price but excellent hardware design for reliable programming. Best "value for money" in this class.

BeeProg is a fast universal USB/LPT interfaced universal programmer and logic IC tester with 48 powerful pindrivers. Using build-in in-circuit serial programming (ISP) connector the programmer is able to program ISP capable chips in-circuit. This design allows easily add new devices to the device list. BeeProg is a true universal and a true low cost programmer, providing one of the best "value for money" in today's market.

LabProg+ is a universal programmer and logic IC tester with 48 powerful pindrivers. This design allows easily add new devices to the device list. LabProg+ is a true universal and a true low cost programmer, providing one of the best "value for money" in today's market.

SmartProg is a small, fast and powerful programmer of all kinds of programmable devices. Using build-in in-circuit serial programming (ISP) connector the programmer is able to program ISP capable chips in-circuit. It has design, which allows easily add new devices to the device list. Nice "value for money" in this class.

PREPROM-02aLV is a small and powerful EPROM, EEPROM, Flash EPROM and serial EEPROM programmer and static RAM tester, designed for professional mobile applications. In addition, PREPROM-02aLV programmer with auxiliary modules support also microprocessors (MCS48, MCS51, PIC, AVR), GALs, etc. Programmer can work with 'true LV' device too - from 2V.

MEMprog is a little powerful and very fast portable programmer for EPROM, EEPROM, Flash EPROM, NVRAM and serial EEPROM programmer and static RAM tester.

T51prog is little, powerful and very fast portable programmer for MCS51 series and Atmel AVR microcontrollers with ISP capability. T51prog enables also programming serial EEPROM with interface types IIC (24Cxx), Microwire (93Cxx) and SPI (25Cxx).

51&AVRprog is little and portable programmer for MCS51 series and Atmel AVR microcontrollers. 51&AVRprog enables also programming serial EEPROM with interface types IIC (24Cxx), Microwire (93Cxx) and SPI (25Cxx).

PIKprog+ is little, very fast and powerful portable programmer for PICmicro® family microcontrollers and serial EEPROM with IIC (24Cxx), Microwire (93Cxx) and SPI (25Cxx) interface types. Using build-in in-circuit serial programming (ISP) connector programmer is able to program PICmicro® family microcontrollers using serial algorithms.

PIKprog is little and portable programmer for Microchip PICmicro series of microcontrollers. PIKprog enables also programming serial EEPROM with interface types IIC (24Cxx), Microwire (93Cxx) and SPI (25Cxx).

SEEpog is universal programmer of all serial EEPROM in 8 pin DIL package. SEEpog programs EEPROM with interface IIC, SPI and Microwire, and also specialty as for example digital thermometers. The programmer supports LV (3.3V) devices too.

All programmers of our works with almost any IBM compatible PC, AT or higher, portable or desktop personal computers. No special interface card is required to connect to the PC, since programmers use the parallel (printer) port.

All programmers function flawlessly on systems running DOS, Windows 3.x, Windows 95/98/Me/NT/2000/XP.

All programmers are driven by an **easy-to-use, control program** with pull-down menus, hot keys and online help. There are available two SW versions - for DOS (PG4U) and for WIN95/98/Me/NT/2000/XP (PG4UW). Control program is common for all the ELNEC's programmers (JetProg, BeeProg, LabProg+, SmartProg, PREPROM-02aLV, MEMprog, T51prog, 51&AVRprog, PIKprog+, PIKprog and SEEpog).

Note: *DOS version of SW for programmers has been discontinued since 7/2003.*

Advanced design, including protection circuits, original brand components and careful manufacturing allows us to provide a **one-year** (MEMprog, T51prog, 51&AVRprog, PIKprog+, PIKprog and SEEpog) to **three-year** (JetProg, BeeProg, LabProg+, SmartProg, PREPROM-02aLV) **warranty** on parts and labour for the programmers (limited 25,000 cycle warranty on ZIF socket). This warranty terms are valid for customers, who purchase a programmer directly from Elnec company. The warranty conditions of Elnec sellers may differ depending on the target country law system or Elnec seller's warranty policy.



Free additional services:

- free technical support (phone/fax/e-mail).
- free lifetime software update via Web site.

Free software updates are available from our Internet address **www.elnec.com**.

We also offer the following new services in our customer support program: Keep-Current and AlgOR.

- **Keep-Current** is a service by which ELNEC ships to you the latest version of the control program for programmer and the updated user documentation. A Keep-Current service is your hassle-free guarantee that you always have access to the latest software and documentation, at minimal cost.
- **AlgOR** (Algorithm On Request) service allows you to receive from ELNEC software support for programming devices not yet available in the current device list.

Note: *We don't recommend use programmers LabProg+, PREPROM-02aLV, MEMprog, 51&AVRprog, PIKprog and SEEprog for In-circuit programming. See FAQ on site www.elnec.com.*

Products configuration

Before installing and using your programmer, please carefully check that your package includes all next mentioned parts. If you find any discrepancy with respective parts list and/or if any of these items are damaged, please contact your distributor immediately.

JetProg, BeeProg, LabProg+, SmartProg, PREPROM-02aLV, MEMprog, T51prog and PIKprog+ programmer configuration

- programmer
- cable with two 25 pin, D-type connectors for connecting the programmer to the PC
- USB cable for connecting the programmer to the PC (only for BeeProg)
- external power supply (suitable for respective programmer)
- diagnostic POD for selftest of programmer
- cap for ZIF socket (anti-dust cover)
- this User's manual
- CD with the control program and additional files
- "DEVICE PROBLEM REPORT" form
- registration card
- shipping case

51&AVRprog, PIKprog and SEEprog programmer configuration

- programmer
- cable with two D-type connectors for connecting the programmer to the PC
- external power supply (suitable for respective programmer)
- this User's manual
- CD with the control program and additional files
- "DEVICE PROBLEM REPORT" form
- registration card
- shipping case



PC requirements

Minimal PC requirements

- PC AT 10 MHz (DOS version software), PC 486 (WIN version software)
- 512 KB free RAM (DOS version software), 16MB RAM (WIN version software)
- one CD drive
- HDD, 20 MB free space
- operating system MS/PC-DOS version 3.2 or later, WIN 3.xx, WIN95/98/Me/NT/2000/XP
- one free printer port with nothing attached

Note: *DOS version of SW for programmers has been discontinued since 7/2003.*

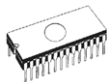
Recommended PC requirements

- Pentium PC 100MHz or higher
- 32 MB free RAM
- one CD drive
- HDD with minimum 20 MB free space
- operating system: MS Windows 95/98/Me/NT/2000/XP
- one free bi-directional printer port with nothing attached
- for JetProg, BeeProg, SmartProg, MEMprog, T51prog and PIKprog+ free parallel (printer) port on PCI bus, IEEE 1284 compatible (ECP/EPP)
- for BeeProg one USB port, 2.0 compatible

Note: *For convenience, we suggest that you use a supplementary multi I/O card to provide an additional printer port (LPT2 for example), in order to avoid sharing the same LPT port between printer and programmer.*



Quick Start



Installing programmer hardware

- switch off the PC and programmer
- connect the communication port of programmer to a printer port of PC using cable supplied
- switch on the PC
- connect the connector of the power supply adapter to the programmer

Installing the programmer software

Run the installation program from the CD (DOS: Install.exe, WIN: Setup.exe) and follow the on-screen instructions. Please, for latest information about the programmer hardware and software see www.elnec.com.

Note: *DOS version of SW for programmers has been discontinued since 7/2003.*

Using programmer software

Launch PG4U.EXE (DOS) or PG4UW.EXE (WIN) to enter the control program. The menu **Device** contains the device manipulation commands. The menu **File** contains commands for files and directories. The menu **Buffer** is to be used for buffer manipulation.

Programming a device - the shortest way

Use the hot key **<Alt+F5>** to input the device name and/or manufacturer to select the desired type of target device. If you want to copy an existing device, insert it into the ZIF socket of the programmer and then press key **<F7>**. If you want to program a target device with data from a disk press key **<F3>** and read the appropriate file into the buffer. Then insert your target device into the ZIF socket. To check if the device is blank - press key **<F6>**. Now you can program the device by pressing key **<F9>**. After programming you may perform additional verification by pressing key **<F8>**.



Detailed description

BeeProg





Introduction

BeeProg is a first member of new USB-compatible generation of Windows 95/98/Me/NT/2000/XP based ELNEC **universal programmers** built to meet the strong demand of the developers community for the fast, the all programmer user community of users.

BeeProg supports all kinds of types and silicon technologies of today and tomorrow programmable devices without family-specific module. Using build-in in-circuit serial programming (ISP) connector the programmer is able to program ISP capable chips in circuit.

BeeProg isn't only programmer, but also tester of TTL/CMOS logic ICs and memories. Furthermore, it allows generating user-definable test pattern sequences.

BeeProg provides very competitive price but excellent hardware design for reliable programming. Probably best "value for money" programmer in this class.

Very fast programming due to high-speed FPGA driven hardware and execution of time-critical routines inside of the programmer. At least fast than competitors in this category.

BeeProg interfaces with the IBM PC, 486 to Pentium, portable or desktop personal computers through USB (2.0) port or any standard parallel (printer) port. Programmer also supports IEEE1284 (ECP/EPP) high-speed parallel port. Support of USB/LPT port connection give you choice to connect the BeeProg programmer to any PC, from latest notebook to older desktop without USB port.

BeeProg has a FPGA based totally reconfigurable 48 powerful TTL pindrivers provide H/L/pull_up/pull_down and read capability for each pin of socket. Advanced pindrivers incorporate **high-quality high-speed** circuitry to deliver signals without overshoot or ground bounce for all supported devices. Pin drivers operate down to 1.8V so you'll be ready to program the full range of today's advanced low-voltage devices.

BeeProg performs device **insertion test** (wrong or backward position) and **contact check** (poor contact pin-to-socket) before it programs each device. These capabilities, supported by **overcurrent protection** and **signature-byte check** help prevent chip damage due to operator error.

Built-in **protection circuits** eliminate damage of programmer and/or programmed device due environment or operator failure. All the inputs of the BeeProg programmer, including the ZIF

socket, connection to PC and power supply input, are **protected against ESD** up to 15kV.

BeeProg programmer performs programming **verification** at the **marginal level** of supply voltage, which, obviously, improves programming yield, and guarantees long data retention.

Various **socket converters** are available to handle device in PLCC, SOIC, PSOP, TSOP, TQFP and other packages.

BeeProg programmer is driven by an **easy-to-use** control program with pull-down menu, hot keys and on-line help. Selecting of device is performed by its class, by manufacturer or simply by typing a fragment of vendor name and/or part number.

Standard device-related commands (read, blank check, program, verify, erase) are boosted by some **test functions** (insertion test, signature-byte check), and some **special functions** (autoincrement, production mode - start immediately after insertion of chip into socket).

All known data formats are supported. Automatic file format detection and conversion during load of file.

The rich-featured **autoincrement function** enables to assign individual serial numbers to each programmed device - or simply increments a serial number, or the function enables to read serial numbers or any programmed device identification signatures from a file.

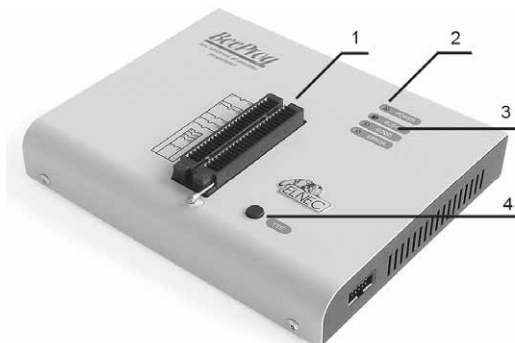
It is important to remember that in most cases new devices require **only a software update** due to the BeeProg is truly universal programmer. With our prompt service you can have new devices can be added to the current list within hours!

Advanced design including protection circuits, original brand components and careful manufacturing allows us to provide a **three-year warranty** on parts and labour for the BeeProg (limited 25,000-cycle warranty on ZIF socket).



BeeProg elements

- ① 48 pin ZIF socket
- ② LED indicator power/sleep
- ③ LED indicators for work result
- ④ YES! Button



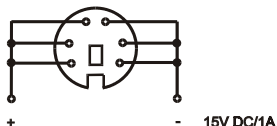
- ⑤ LPT connector for PC <-> BeeProg communication cable
- ⑥ LPT connector for PC <-> BeeProg communication cable
- ⑦ Power supply connector



- ⑧ ISP connector



Power supply connector



Note: Due to low power consumption of BeeProg in inactive state, it doesn't require power switch. When the power LED indicator glows with a low intensity the BeeProg is in inactive mode.

Connecting BeeProg to the PC

Using LPT port

Switch off PC and programmer. Insert the communication cable included with your BeeProg programmer package to a free printer port on your PC. If your computer is equipped with only one printer port, substitute the programmer cable for the printer cable. Connect the opposite cable end to the programmer. Screw on both connectors to counter-connectors. This is very important. It may be uncomfortable to switch between printer cable and programmer cable, though it is not recommended to operate the BeeProg programmer through a mechanical printer switch. Use of an electronic printer switch is impossible. But you can install a second multi-I/O in your computer, thus obtaining a supplementary printer port, says LPT2. So your printer may remain on LPT1 while the programmer on LPT2.

Switch on the PC.

Connect the mains connector of the power supply to a mains plug, and then connect the mini-DIN connector to the programmer's connector labeled "15VDC". At this time all 'work result' LEDs (and 'POWER' LED) light up successive and then switch off. Once the POWER LED lights with low brightness then the BeeProg programmer is ready to run.

Next run the control program for BeeProg.

Caution! *If you don't want to switch off your PC when connecting the BeeProg, proceed as follows:*

- **When connecting** the programmer to the PC: **FIRST** insert the **communications cable** and **THEN** the **power-supply connector**.
- **When disconnecting** the programmer from the PC: **FIRST** disconnect the **power-supply connector** and **THEN** the **communication cable**.

From BeeProg's point of view the connecting and disconnecting sequence is irrelevant. Protection circuits on all programmer inputs keep it safe. **But think of your PC please.**

Using USB port

In this case, order of connecting USB cable and power supply to programmer is irrelevant.

Note: *Programmer's protection electronics protect the target device and the programmer itself against either short or long-term power failures and, partly, also against a PC failure. However, it is not possible to grant the integrity of the target device due to incorrect, user-selected programming*



parameters. Target device may be not destroyed by forced interruption of the control program (reset or switch-off PC), by removing the physical connection to the programmer, but the content of actually programmed cell may remains undefined. Don't unplug the target device from the ZIF socket during work with device (LED BUSY shine).

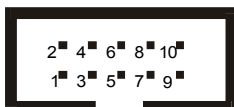
Problems related to the BeeProg ↔ PC interconnection, and their removing

If you have any problems with BeeProg ↔ PC interconnection, see section Common notes please.

In-system serial programming by BeeProg

For general definition, recommendation and direction about ISP see section **Common notes / ISP** please.

Description of BeeProg ISP connector



Front view at ISP connector of programmer.

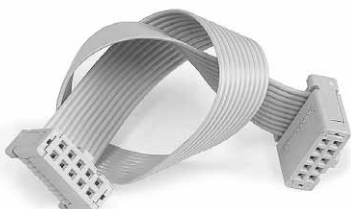
Capability of ISP connector pins

Pin	Description
1	VCCP for target device, with sense
2,4, 6, 8,10	H/L/read, GND, VPP
3	H/L/read, GND, VCCP, VPP
5	Target system supply voltage
7,9	GND

Specification of ISP connector pins depends on programming device and is displayed at **Device info window (Ctrl+F1)**. The ISP programming way of respective chip must be selected. It is indicated by (ISP) suffix after name of chip, you want to be programmed.

These specifications correspond with application notes published of device manufacturers. Used application notes you may find on www.elnec.com, section application notes.

Note: Pin no. 1 is signed by triangle scratch on ISP cable connectors.

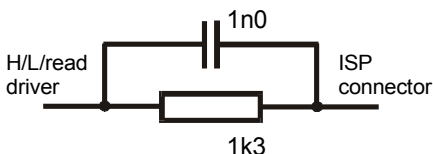


BeeProg ISP cable

**Warnings:**

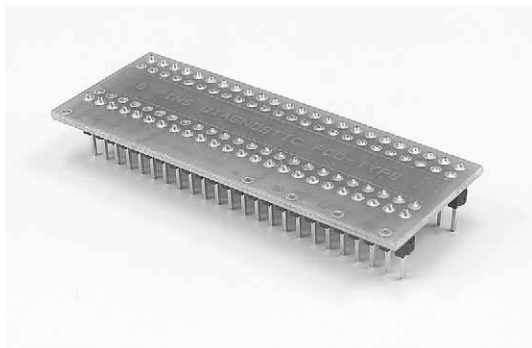
- **When you use BeeProg as ISP programmer, don't insert device to ZIF socket.**
- **When you program devices in ZIF socket, don't insert ISP cable to ISP connector.**
- Use only **attached ISP cable**. When you use other ISP cable (other material, length...), programming may occur unreliable.
- **BeeProg can supply** programmed device (pin 1 of ISP connector) and target system (pin 5 of ISP connector) with limitation (see Technical specification / ISP connector), but target system **cannot supply BeeProg**.
- BeeProg apply programming voltage to target device and checks his value (target system can modify programming voltage). If the programming voltage is different as expected, no action with target device will be executed.

Note: H/L/read BeeProg driver



Selftest and Calibration

If you feel that your programmer does not react according to your expectation, please run the programmer selftest using Diagnostic POD, enclosed with the standard delivery package. For optimal results with programmer we recommend you undertake every 6 months, an extended test and to check the calibration. See instructions for selftest in the **Diagnostics** menu of PG4UW.





Technical specification

HARDWARE

Base unit, DACs

- USB 2.0 port
- FPGA based IEEE 1284 slave printer port, up to 1MB/s transfer rate
- on-board intelligence: powerful microprocessor and FPGA based state machine
- three D/A converters for VCCP, VPP1, and VPP2, controllable rise and fall time
- VCCP range 0..8V/1A
- VPP1, VPP2 range 0..26V/1A
- autocalibration
- selftest capability
- protection against surge and ESD on power supply input, parallel port connection

Socket, pindriver

- 48-pin DIL ZIF (Zero Insertion Force) socket accepts both 300/600 mil devices up to 48-pin
- pindrivers: 48 universal
- VCCP / VPP1 / VPP2 can be connected to each pin
- perfect ground for each pin
- FPGA based TTL driver provides H, L, CLK, pull-up, pull-down on all pindriver pins
- analog pindriver output level selectable from 1.8 V up to 26V
- current limitation, overcurrent shutdown, power failure shutdown
- ESD protection on each pin of socket (IEC1000-4-2: 15kV air, 8kV contact)
- continuity test: each pin is tested before every programming operation

ISP connector

- 10-pin male type with missinsertion lock
- 5 TTL pindrivers, provides H, L, CLK, pull-up, pull-down; level H selectable from 1.8V up to 5V to handle all (low-voltage including) devices.
- 1x VCCP voltage (range 2V..7V/100mA) and 1x VPP voltage (range 2V..25V/50mA)
- programmed chip voltage (VCCP) with both source/sink capability and voltage sense
- target system supply voltage (range 2V..6V/250mA)

DEVICE SUPPORT

Programmer

- EPROM: NMOS/CMOS, 2708*, 27xxx and 27Cxxx series, with 8/16 bit data width, full support for LV series
- EEPROM: NMOS/CMOS, 28xxx, 28Cxxx, 27EExxx series, with 8/16 bit data width
- Flash EPROM: 28Fxxx, 29Cxxx, 29Fxxx, 29BVxxx, 29LVxxx, 29Wxxx, 49Fxxx series, from 256Kbit to 32Mbit, with 8/16 bit data width, full support for LV series
- Serial E(E)PROM: 17Xxxx, 18Vxxx, 24Cxxx, 24Fxxx, 25Cxxx, 45Dxxx, 59Cxxx, 85xxx, 93Cxxx, EPCxxx, NVM3060, MDAXxx series, full support for LV series
- PROM: AMD, Harris, National, Philips/Signetics, Tesla, TI
- NV RAM: Dallas DSxxx, SGS/Inmos MKxxx, SIMTEK STKxxx, XICOR 2xxx, ZMD U63x series
- PLD: SPLD, CPLD series: Altera, Atmel, AMD-Vantis, Lattice, NS, Philips, TI, ...
- Microcontrollers 48 series: 87x41, 87x42, 87x48, 87x49, 87x50 series
- Microcontrollers 51 series: 87xx, 87Cxxx, 87LVxx, 89Cxxx, 89Sxxx, 89LVxxx, all manufacturers, Philips 87C748..752 series
- Microcontrollers Intel 196 series: 87C196 KB/KC/KD/KT/KR/...
- Microcontrollers Atmel AVR: AT90Sxxxx, ATtiny series
- Microcontrollers Microchip PICmicro: PIC12Cxxx, PIC16C5x, PIC16Cxxx, PIC17Cxxx, PIC18Cxxx series
- Microcontrollers Motorola: 68HC05, 68HC08, 68HC11 series
- Microcontrollers National: COP8xxx series
- Microcontrollers NEC: uPD78Pxxx series
- Microcontrollers Scenix (Ubicom): SX18xxx, SX20xxx, SX28xxx series
- Microcontrollers SGS-Thomson: ST6xx series
- Microcontrollers TI: MSP430 series
- Microcontrollers ZILOG: Z86xxx series
- Microcontrollers others: Holtek, Samsung, Scenix, Fujitsu, Hitachi, NEC, Toshiba, Cypress, TI

Notes:

- *Devices marked * are obsolete, programming with additional module*
- *For all supported devices see actual **Device list***

I.C. Tester

- TTL type: 54,74 S/LS/ALS/H/HC/HCT series
- CMOS type: 4000, 4500 series
- static RAM: 6116.. 624000
- user definable test pattern generation



Package support

- package support includes DIP, PLCC, SDIP, SOIC, PSOP, TQFP, TSOP and other
- support all devices in DIP with default socket
- support devices in non-DIP packages up to 48 pins with universal adapters
- programmer is compatible with third-party adapters for non-DIP support

Programming speed

Note. These times strongly depend on PC speed, LPT port type and operating system free resources. Therefore are given values of two different PC configurations for comparison.

These times are only for illustration, for actual times see www.elnec.com.

Device	Operation	Time A	Time B	Time C
27C010	programming and verify	24 sec	20 sec	24 sec
AT29C040A	programming and verify	38 sec	28 sec	38 sec
AM29F040	programming and verify	49 sec	42 sec	49 sec
PIC16C67	programming and verify	8 sec	7 sec	8 sec
PIC18F452	programming and verify	13 sec	9 sec	13 sec

Time A conditions: *Pentium MMX, 250 MHz, ECP/EPP, WIN98.*

Time B conditions: *Athlon, 750 MHz, ECP/EPP on PCI bus, WIN98.*

Time C conditions: *Athlon, 750 MHz, USB, WIN98.*

SOFTWARE

- **Algorithms:** only manufacturer approved or certified algorithms are used. Custom algorithms are available at additional cost.
- **Algorithm updates:** software updates are available approx. every 2 weeks, free of charge.
- **Main features:** revision history, session logging, on-line help, device and algorithm information

Device operations

- **standard:**
 - intelligent device selection by device type, manufacturer or typed fragment of part name
 - automatic ID-based selection of EPROM/Flash EPROM
 - blank check, read, verify
 - program
 - erase
 - configuration and security bit program

- illegal bit test
- checksum
- **security**
 - insertion test, reverse insertion check
 - contact check
 - ID byte check
- **special**
 - production mode (automatic start immediately after device insertion)
 - auto device serial number increment
 - statistic
 - count-down mode

Buffer operations

- view/edit, find/replace
- fill/copy, move, byte swap, word/dword split
- checksum (byte, word)
- print

File load/save

- no download time because programmer is PC controlled
- automatic file type identification

Supported file formats

- unformatted (raw) binary
- HEX: Intel, Intel EXT, Motorola S-record, MOS, Exormax, Tektronix, ASCII-space-HEX
- Altera POF, JEDEC (ver. 3.0.A), e.g. from ABEL, CUPL, PALASM, TANGO PLD, OrCAD PLD, PLD Designer ISDATA, etc.

PC system requirements

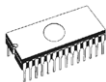
See section *Introduction/ PC requirements*

GENERAL

- operating voltage 15..18V DC, max. 1A
- power consumption max. 12W active, about 2W inactive
- dimensions 160x190x42 [mm] (6.3x7.5x1.7 [inch])
- weight (without external adapter) 900g
- temperature 5°C ÷ 40°C (41°F ÷ 104°F)
- humidity 20%..80%, non condensing

Base configuration package includes

- BeeProg programmer
- USB connection cable, LPT connection cable
- ISP cable



- diagnostic POD for selftest
- anti-dust cover for ZIF socket
- switching power adapter 100..240V AC/15V DC/1A
- user manual
- software
- registration card
- transport case

Additional services

- Keep Current.
- AlgOR
- free technical support (phone/fax/e-mail).
- free lifetime software update via Web site.